

CLAIMS

1. A thermoplastic composition obtained by mixing a polyamide and/or polyester matrix with at least:
- 5 (i) a first additive of formula $R-Z_u$, in which:
 R represents a hydrocarbon radical which may comprise one or more heteroatoms,
 u is an integer greater than or equal to 1,
 and
 10 Z is an acid, amine or alcohol functional group;
 and
- (ii) a second additive chosen from the group consisting of:
- (A) an additive obtained by the reaction between
 15 at least:
 a) one multifunctional compound of formula

$$R^1-X_n \quad (I)$$

 b) one multifunctional compound of formula
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$$R^3-Y \quad (III); \text{ and}$$

 c) optionally one bifunctional monomer of formula (II) or the corresponding cyclic form:

$$X-R^2-Y \quad (II); \text{ and}$$

 25 (B) one additive obtained by the reaction between at least:
 a) one monofunctional compound of formula

$$R^3-Y \quad (III)$$

 30 b) one branching compound of formula (IV):

$$Y-R^4-X_m \quad (IV)$$

 c) optionally one multifunctional compound of formula (I):

$$R^1-X_n \quad (I); \text{ and}$$

 35 d) optionally one bifunctional monomer of formula (II) or the corresponding cyclic form:



in which:

- R^1 , R^2 , R^3 and/or R^4 represent, independently of each other, a hydrocarbon radical optionally comprising one or more heteroatoms;
- X and Y are antagonist reactive functional groups capable of reacting with each other to form an amide bond;
- n is an integer between 3 and 50;
- m is an integer between 2 and 10; and
- R, R^1 , R^2 , R^3 and R^4 do not comprise an amine, acid or alcohol functional group capable of forming an amide and/or ester bond.

2. The composition as claimed in claim 1, characterized in that the composition comprises from 0.01 to 5% by weight of the first additive (i) relative to the total weight of the composition.

3. The composition as claimed in either of claims 1 and 2, characterized in that the composition comprises from 0.01 to 20% by weight of the second additive (ii) relative to the total weight of the composition.

4. The composition as claimed in any one of claims 1 to 3, characterized in that the radical R of the first additive (i) represents a linear or branched, saturated or unsaturated, aliphatic, cyclic and/or aromatic hydrocarbon radical which may optionally comprise one or more heteroatoms, the radical R comprising from 2 to 100 carbon atoms.

5. The composition as claimed in any one of claims 1 to 4, characterized in that the first additive (i) is chosen from the group comprising: isophthalic acid, terephthalic acid, adipic acid, trimesic acid, 2,2,6,6-tetrakis(β -carboxyethyl)cyclohexanone, diaminopropane-N,N,N',N'-tetraacetic acid, nitrilotrialkylamines,

trialkylenetetraamines, tetraalkylenepentaamines, 4-aminoethyl-1,8-octanediamine, 3,5,3',5'-biphenyltetracarboxylic acid, acid derivatives of phthalocyanine and naphthalocyanine, 1,3,5,7-
5 naphthalenetetracarboxylic acid, 2,4,6-pyridinetricarboxylic acid, 3,5,3',5'-bipyridyltetracarboxylic acid, 3,5,3',5'-benzophenonetetracarboxylic acid, 1,3,6,8-acridinetetracarboxylic acid, 1,2,4,5-
10 benzenetetracarboxylic acid, 1,3,5-triazines, 1,4-diazines, melamine, compounds derived from 2,3,5,6-tetraethylpiperazine, 1,4-piperazines, tetrathiafulvalenes, 2,4,6-tri(aminocaproic acid)-1,3,5-triazine(TACT), dodecylamine, octadecylamine,
15 piperidine, benzylamine, aniline, hexanoic acid, palmitic acid, stearic acid, oleic acid, benzoic acid, behenic acid, oleic acid, polyalkylene oxides comprising at least one amine or acid functional group, glycol, trimethylolpropane, glycerol, pentaerythritol,
20 sorbitol, mannitol, monosaccharides, and/or mixtures thereof.

6. The composition as claimed in any one of claims 1 to 5, characterized in that Y is an amine functional
25 group when X represents a carboxylic acid functional group, or Y is a carboxylic acid functional group when X represents an amine functional group.

7. The composition as claimed in any one of claims 1 to 6, characterized in that the radicals R^1 , R^2 , R^3 and/or R^4 of the second additive (ii) represent,
30 independently of each other, a linear or branched, saturated or unsaturated, aliphatic, cyclic and/or aromatic hydrocarbon radical which may optionally
35 comprise one or more heteroatoms, the radicals R^1 , R^2 , R^3 and/or R^4 comprising from 2 to 100 carbon atoms.

8. The composition as claimed in any one of claims 1 to 7, characterized in that the multifunctional

compound of formula (I) is chosen from the group comprising:
2,2,6,6-tetrakis(β -carboxyethyl)cyclohexanone, diaminopropane-N,N,N',N'-tetraacetic acid, nitrilotrialkylamines, trialkylenetetraamines and tetraalkylenepentaamines, 4-aminoethyl-1,8-octanediamine, 3,5,3',5'-biphenyltetracarboxylic acid, the acid derivatives of phthalocyanine and naphthalocyanine, 1,3,5,7-naphthalenetetracarboxylic acid, 2,4,6-pyridinetricarboxylic acid, 3,5,3',5'-bipyridyltetracarboxylic acid, 3,5,3',5'-benzophenonetetracarboxylic acid, 1,3,6,8-acridine-tetracarboxylic acid, trimesic acid, 1,2,4,5-benzenetetracarboxylic acid, 1,3,5-triazines, 1,4-diazines, melamine, the compounds derived from 2,3,5,6-tetraethylpiperazine, 1,4-piperazines, tetrathiafulvalenes, 2,4,6-tri(aminocaproic acid)-1,3,5-triazine(TACT), polyalkylene oxides containing at least three acid or amine functional groups, and/or mixtures thereof.

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9. The composition as claimed in any one of claims 1 to 8, characterized in that the bifunctional compound of general formula (II) is chosen from the group comprising: ϵ -caprolactam and/or the corresponding amino acid: aminocaproic acid, para- or meta-aminobenzoic acid, 11-aminoundecanoic acid, lauryllactam and/or the corresponding amino acid, 12-aminododecanoic acid, caprolactone, 6-hydroxyhexanoic acid, and oligomers and/or mixtures thereof.

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10. The composition as claimed in any one of claims 1 to 9, characterized in that the monofunctional compound of general formula (III) is chosen from the group comprising: an aliphatic monoacid or monoamine compound, an aromatic monoamine or monoacid compound, an organophosphorus monoamine or monocarboxylic acid compound, an organosulfo monoamine or monocarboxylic acid compound, a quaternary ammonium monoamine or monocarboxylic acid compound and/or mixtures thereof.

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11. The composition as claimed in any one of claims 1 to 10, characterized in that the monofunctional compound of general formula (III) is chosen from the group comprising: n-hexadecylamine, n-octadecylamine, n-dodecylamine, benzylamine, aminomethylphosphonic acid, sulfanilic acid, sulfobenzoic acid, betaine, and/or mixtures thereof.
12. The composition as claimed in any one of claims 1 to 11, characterized in that the branching compound of formula (IV) is chosen from the group comprising: 5-aminoisophthalic acid, 6-aminoundecandioic acid, 3-aminopimelic diacid, aspartic acid, 3,5-diaminobenzoic acid, 3,4-diaminobenzoic acid, lysine and/or mixtures thereof.
13. The composition as claimed in any one of claims 1 to 12, characterized in that the additive (ii) (A) is a functionalized star-shaped polyamide obtained by the reaction of at least: one multifunctional compound of formula (I), one bifunctional monomer of formula (II) or the corresponding cyclic form, and one monofunctional compound of formula (III).
14. The composition as claimed in any one of claims 1 to 13, characterized in that the additive (ii) (B) is a functionalized hyperbranched polyamide obtained by the reaction of at least: optionally one multifunctional compound of formula (I), one bifunctional monomer of formula (II) or the corresponding cyclic form, one monofunctional compound of formula (III), and one branching compound of formula (IV).
15. The composition as claimed in any one of claims 1 to 14, characterized in that the additive (ii) (A) may be obtained by the reaction between a multifunctional compound of formula (I) in proportions of between 1 and 30% by weight, a monofunctional compound of formula

(III) in proportions of between 5 and 60% by weight, and optionally a bifunctional monomer of formula (II) in proportions of between 0 and 95% by weight.

- 5 16. The composition as claimed in any one of claims 1 to 15, characterized in that the additive (ii) (B) is obtained by the reaction between a monofunctional compound of formula (III) in proportions of between 20 and 70% by weight, a branching compound of formula (IV) 10 in proportions of between 10 and 50% by weight, optionally a multifunctional compound of formula (I) in proportions of between 0 and 10% by weight and optionally a bifunctional monomer of formula (II) in proportions of between 0 and 50% by weight.
- 15 17. The composition as claimed in any one of claims 1 to 16, characterized in that the content of terminal acid and amine groups of the second additive (ii) is between 0 and 300 meq/kg.
- 20 18. The composition as claimed in any one of claims 1 to 17, characterized in that the polyamide matrix is composed of a (co)polyamide chosen from the group comprising: polyamide 6, polyamide 6,6, polyamide 4, 25 polyamide 11, polyamide 12, polyamides 4-6, 6-10, 6-12, 6-36, 12-12, and copolymers and mixtures thereof.
- 30 19. The composition as claimed in any one of claims 1 to 18, characterized in that it comprises reinforcing or bulk fillers.
- 35 20. The composition as claimed in any one of claims 1 to 18, characterized in that it comprises from 1 to 70% by weight, preferably from 10 to 60% by weight, more specifically from 30 to 50% by weight.
21. The composition as claimed in claim 19 or 20, characterized in that the reinforcing fillers are glass fibers.

22. A process for the manufacture of a composition as
claimed in any one of claims 1 to 21, characterized in
that at least the first additive (i) and the second
5 additive (ii) are mixed with the polyamide and/or
polyester matrix.

23. A process for the manufacture of an article by
forming a composition as claimed in any one of claims 1
10 to 21, by a process chosen from the group comprising an
extrusion, molding, injection and drawing device.

24. An article obtained by forming a composition as
claimed in any one of claims 1 to 21.
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